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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/667,737	09/22/2003	Christian X. Campbell	2003P14126 US	1892

7590 09/27/2005

Siemens Corporation
Intellectual Property Department
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EXAMINER	
MILLER, DANIEL H	
ART UNIT	**PAPER NUMBER**
1775	

DATE MAILED: 09/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/667,737	CAMPBELL, CHRISTIAN X.	
	Examiner	Art Unit	
	Daniel Miller	1775	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07-08-05*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16 and 18-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *1-10* is/are allowed.

6)☒ Claim(s) *11-16 and 18-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claim 20 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claim 20 recites the limitation"...elastic modulus of approximately 150 Gpa." This limitation is new matter. The specification provides no explicit support that the property is exhibited.

Claim Rejections - 35 USC § 103

4. Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vance et al (U.S. 6,106,959) in view of Manning (U.S. 4,552,852).

Vance et al discloses an article comprising a YAG ceramic substrate, and an overlayer comprising zirconia-hafnia disposed on the ceramic substrate (column 3 line 15-45). Vance is silent as to the presence of alumina in the ceramic overlayer.

Manning teaches a zirconia-hafnia ceramic containing alumina (column 3 line 40-50). Manning further teaches that alumina zirconia composites have increased thermal shock capacity (column 1 line 25-30).

It would have been obvious to a person of ordinary skill at the time of the invention to modify Vance with the ceramic of Manning because it would increase thermal shock capacity.

5. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Vance et al. in view of Manning, as applied to claim 11, and further in view of Lee et al.

Vance teaches all the limitations of claim 11 as above but is silent as to a (oxygen barrier layer) mullite layer being interposed between the coating and the substrate and further is silent on the substrate being a non-oxide substrate.

Lee teaches a stabilized zirconia layer followed by a (oxygen barrier layer) mullite-containing layer. The mullite layer is an oxygen barrier layer interposed between the substrate. Lee also teaches a non-oxide substrate (column 8 line 20). The layers of Lee increase stability at high temperature (column 3 line 15-25).

It would have been obvious to a person of ordinary skill at the time of the invention to combine the coating of Vance with the layers of Lee to increase stability at high temperatures.

6. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al. in view of Vance et al and further in view of Manning.

Lee teaches a stabilized zirconia layer followed by a mullite-containing layer. The mullite layer is an insulating mullite layer interposed between the coating and ceramic matrix substrate as in figure 1. Lee does not teach a zirconia –hafnia layer.

Vance teaches a zirconia-hafnia overlay of figure 1. This layer is chosen because of its improved stability at higher temperatures (column 3 line 15-25). However, both Vance and Lee are silent as to the presence of Alumina in the Zirconoa-hafnia overlay.

Manning teaches a ceramic having a zirconia-hafnia and alumina composition. The zirconia-hafnia composition of Manning remains stable at higher temperatures then traditional stabilized zirconia (column 3 line 60-65). Further, the composition of Lee Vance and Manning would necessarily have an elastic modulus of approximately 150 Gpa given that it has substantially similar or identical in composition.

It would have been obvious to a person of ordinary skill at the time of the invention to combine the coating of Vance with the layers of Lee to increase stability at higher temperatures.

It would have been obvious to a person of ordinary skill at the time of the invention to combine the overlay of Vance in view of Lee as in claim 19 with the ziconia-hafnia, and alumina ceramic composition of Manning, because it would create higher stability.

7. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lee in view of Vance and further in view of Manning.

Vance in view of Lee teaches all the elements of claim 19 as above, but are silent on the zirconia-hafnia layer also comprising alumina and an elastic modulus of 150 Gpa.

Manning teaches a ceramic having a zirconia-hafnia and alumina composition. The zirconia-hafnia composition of Manning remains stable at higher temperatures then traditional stabilized zirconia (column 3 line 60-65). Further, the composition of Lee Vance and Manning would necessarily have an elastic modulus of approximately 150 Gpa given that it has substantially similar or identical in composition.

It would have been obvious to a person of ordinary skill at the time of the invention to combine the overlay of Vance in view of Lee as in claim 19 with the ziconia-hafnia, and alumina ceramic composition of Manning, because it would create higher stability.

8. Claims 14-16, and 18 are rejected under 35 USC 103(a) as being obvious over Vance in view of Manning as applied to claim 11 above.

As stated above, Vance in view of Manning disclose the limitations of claim 11.

Although Vance in view of manning is silent on the molar percentage of hafnia in the zirconia-hafnia filler powder and are also silent on the portion of alumina, absent a showing of criticality with respect to the molar percentage of hafnia and alumina (both result effective variables), it would have been obvious to a person of ordinary skill in the art at the time of the invention to optimize the molar percentage through routine experimentation. It

has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Allowable Subject Matter

9. Claims 1-10 are allowed over the art of record.

The following is a statement of reasons for the indication of allowable subject matter:

The applicants' amendment to base claim 1, in which the applicants added the limitation of a particle size of at least 30 microns or greater overcame the reference thereby creating allowable subject matter. The Manning reference used to reject these claims in the previous action teaches the use of particles 15 microns or less. This means that the closest prior art specifically teaches away from this limitation.

Response to Arguments

10. Regarding claims 1-10 applicants' arguments filed 07/08/2005 have been fully considered. Claim 1 is allowable because of the addition of limitation requiring a particle size of at least 30 microns. The Manning reference teaches away from using particles larger than 30 microns (see above). The reference teaches specifically the use of zirconia-hafnia particles 15 microns or smaller. Claims 2-10 are allowable because they depend from the allowed claim 1.

Regarding claim 11-16, and 18, independent claim 11 was amended to add, "composite particles comprising alumina and monoclinic zirconia-hafnia," however the

examiner is not convinced by applicants' argument that this traverses the art of record. The alumina in Manning is added to the zirconia-hafnia composite and then refired to prevent microcracking (see abstract and column 5). This is the same process used by applicants to make the composite particle (18). The applicants discloses the mixing of particles (22) and (24), which are alumina and zirconia-hafnia composite respectively, and then those particles are refired to create composite particle (18) (see specification page 5 line 2-5). For the following reasons the rejection is maintained.

Regarding claims 19 and 20, the applicants added the limitation of alumina in the hafnia-zirconia ceramic coating to independent claim 19. The examiner is not convinced by applicants' argument and the rejection is maintained as in the previous action.

The alumina powder in Manning is added to the zirconia-hafnia composite powder and then refired to prevent microcracking (see abstract and column 5). This is the same process used by applicants to make composite particle (18). The applicants discloses the mixing of particles (22) and (24), which are alumina and zirconia-hafnia composite respectively, and then those particles are refired to create composite particle (18) (see specification page 5 line 2-5). The examiner see no difference between the two teachings. For the following reasons the rejection is maintained.

Regarding claim 20, applicants have added the limitation "elastic modulus of approximately 150 Gpa". No explicit support can be found for this limitation in applicants' originally filed specification and a new matter rejection under 35 U.S.C. 112 1st paragraph has been made.

Conclusion

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel Miller whose telephone number is (571) 272-1534. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Deborah Jones can be reached on (571) 272-1535. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Daniel Miller

STEPHEN STEIN
PRIMARY EXAMINER